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L1: Entry 1 of 1

File: USPT

Mar 12, 2002

US-PAT-NO: 6355468DOCUMENT-IDENTIFIER: US 6355468 B1**** See image for Certificate of Correction ******TITLE:** Phenylalanine ammonia lyase polypeptide and polynucleotide sequences and methods of obtaining and using same**DATE-ISSUED:** March 12, 2002**INVENTOR-INFORMATION:**

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yoshida; Roberta K.	Buffalo Grove	IL		
Kootstra; Anna B.	Island Lake	IL		

US-CL-CURRENT: 435/232; 435/254.2, 536/23.2**CLAIMS:**

What is claimed is:

1. An isolated and purified yeast phenylalanine ammonia lyase polypeptide comprising the sequence of SEQ ID NO:13.
2. An isolated and purified yeast phenylalanine ammonia lyase polypeptide, wherein said polypeptide is at least 90% identical with SEQ ID NO:13.
3. A composition that comprises a phenylalanine ammonia lyase polypeptide according to claim 1.
4. An isolated and purified yeast phenylalanine ammonia lyase polypeptide according to claim 1, wherein said polypeptide is encoded by a polynucleotide that comprises the sequence of SEQ ID NO:12.
5. An isolated and purified yeast phenylalanine ammonia lyase polypeptide according to claim 1, wherein said polypeptide is encoded by a polynucleotide that is at least 80% identical with SEQ ID NO:12.
6. An isolated and purified yeast phenylalanine ammonia lyase polypeptide according to claim 1, wherein said polypeptide is encoded by a polynucleotide that specifically hybridizes under high stringency conditions to the sequence of SEQ ID NO:12, and said high stringency conditions comprise hybridization in 50% formamide, 5.times. SSC, at 42.degree. C. overnight, and washing in 0.5.times. SSC and 0.1% SDS, at 50.degree. C.
7. An isolated and purified yeast phenylalanine ammonia lyase polypeptide according to claim 1, wherein said polypeptide is encoded by a polynucleotide

that is obtained from strain ATCC PTA-2224.

8. An isolated and purified yeast phenylalanine ammonia lyase polypeptide that comprises the sequence of SEQ ID NO:13 but is N-terminally truncated by the absence of one or more of amino acids 1 through 6 of SEQ ID NO:13.

9. An isolated and purified yeast phenylalanine ammonia lyase polypeptide that comprises the sequence of SEQ ID NO:13 but is C-terminally truncated by the absence of one or more of amino acids 715 through 720 of SEQ ID NO:13.

10. A composition that comprises a phenylalanine ammonia lyase polypeptide according to claim 2.

11. An isolated and purified yeast phenylalanine ammonia lyase polypeptide that is at least 90% identical with SEQ ID NO:13, wherein said polypeptide is encoded by a polynucleotide that comprises the sequence of SEQ ID NO:12.

12. An isolated and purified yeast phenylalanine ammonia lyase polypeptide that is at least 90% identical with SEQ ID NO:13, wherein said polypeptide is encoded by a polynucleotide that is at least 80% identical with SEQ ID NO:12.

13. An isolated and purified yeast phenylalanine ammonia lyase polypeptide that is at least 90% identical with SEQ ID NO:13, wherein said polypeptide is encoded by a polynucleotide that specifically hybridizes under high stringency conditions to the sequence of SEQ ID NO:12, and said high stringency conditions comprise hybridization in 50% formamide, 5.times. SSC, at 42.degree. C. Overnight, and washing in 0.5.times. SSC and 0.1% SDS, at 50.degree. C.

14. An isolated and purified yeast phenylalanine ammonia lyase polypeptide that is at least 90% identical with SEQ ID NO:13, wherein said polypeptide is encoded by a polynucleotide that is obtained from strain ATCC PTA-2224.

15. An isolated and purified yeast phenylalanine ammonia lyase polypeptide according to claim 2, wherein said polypeptide is N-terminally truncated by the absence of one or more of amino acids 1 through 6 of SEQ ID NO: 13.

16. An isolated and purified yeast phenylalanine ammonia lyase polypeptide according to claim 2, wherein said polypeptide is C-terminally truncated by the absence of one or more of amino acids 715 through 720 of SEQ ID NO: 13.

17. An isolated and purified yeast phenylalanine ammonia lyase polypeptide, wherein said polypeptide is at least 95% identical with SEQ ID NO:13.

18. An isolated and purified yeast phenylalanine ammonia lyase polypeptide, wherein said polypeptide is at least 98% identical with SEQ ID NO:13.

19. An isolated and purified yeast phenylalanine ammonia lyase polypeptide encoded by a polynucleotide that comprises the sequence of SEQ ID NO:12.

20. An isolated and purified yeast phenylalanine ammonia lyase polypeptide encoded by a polynucleotide that specifically hybridizes under high stringency conditions to the sequence of SEQ ID NO:12, and said high stringency conditions comprise hybridization in 50% formamide, 5.times. SSC, at 42.degree. C. overnight, and washing in 0.5.times.SSC and 0.1% SDS, at 50.degree. C.

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L1: Entry 1 of 1

File: USPT

Mar 12, 2002

US-PAT-NO: 6355468DOCUMENT-IDENTIFIER: US 6355468 B1**** See image for Certificate of Correction ****

TITLE: Phenylalanine ammonia lyase polypeptide and polynucleotide sequences and methods of obtaining and using same

DATE-ISSUED: March 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yoshida; Roberta K.	Buffalo Grove	IL		
Kootstra; Anna B.	Island Lake	IL		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
PCBU Services, Inc.,	Wilington	DE			02

APPL-NO: 09/ 624693 [PALM]

DATE FILED: July 24, 2000

INT-CL: [07] C12 N 9/88

US-CL-ISSUED: 435/232; 435/254.2, 536/23.2

US-CL-CURRENT: 435/232; 435/254.2, 536/23.2

FIELD-OF-SEARCH: 435/232, 536/23.2

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

[Search Selected](#) [Search ALL](#) [Clear](#)

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> <u>4436813</u>	March 1984	Wood et al.	435/109
<input type="checkbox"/> <u>4574117</u>	March 1986	Vollmer et al.	435/108
<input type="checkbox"/> <u>4584273</u>	April 1986	Finkelman et al.	435/232
<input type="checkbox"/> <u>4598047</u>	July 1986	McGuire	435/108
<input type="checkbox"/> <u>4600692</u>	July 1986	Wood et al.	435/108
<input type="checkbox"/> <u>4636466</u>	January 1987	McGuire et al.	435/108

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Search Results - Record(s) 1 through 10 of 35 returned.

1. Document ID: US 20040018600 A1

Using default format because multiple data bases are involved.

L3: Entry 1 of 35

File: PGPB

Jan 29, 2004

PGPUB-DOCUMENT-NUMBER: 20040018600

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040018600 A1

TITLE: Microbial conversion of glucose to para-hydroxystyrene

PUBLICATION-DATE: January 29, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Ben-Bassat, Arie	Newark	DE	US	
Qi, Wei Wei	Broomall	PA	US	
Sariaslani, Fateme Sima	Wilmington	DE	US	
Tang, Xiao-Song	Hockessin	DE	US	
Vannelli, Todd M.	Ithaca	NY	US	

US-CL-CURRENT: 435/156; 435/252.3, 435/254.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMVC	Drawn De
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2. Document ID: US 20030170834 A1

L3: Entry 2 of 35

File: PGPB

Sep 11, 2003

PGPUB-DOCUMENT-NUMBER: 20030170834

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030170834 A1

TITLE: Bioproduction of para-hydroxycinnamic acid

PUBLICATION-DATE: September 11, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Gatenby, Anthony A.	Wilmington	DE	US	
Sariaslani, F. Sima	Wilmington	DE	US	
Tang, Xiao-Song	Hockessin	DE	US	

Qi, Wei Wei	Drexel Hill	PA	US
Vannelli, Todd	Ithaca	NY	US

US-CL-CURRENT: 435/135; 435/232, 435/252.3, 435/254.11, 435/254.2, 435/320.1,
435/419, 435/69.1

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Sequences](#) | [Attachments](#) | [Claims](#) | [KMC](#) | [Drawn De](#)

3. Document ID: US 20030079255 A1

L3: Entry 3 of 35

File: PGPB

Apr 24, 2003

PGPUB-DOCUMENT-NUMBER: 20030079255

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030079255 A1

TITLE: Methods for the production of tyrosine, cinnamic acid and para-hydroxycinnamic acid

PUBLICATION-DATE: April 24, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Qi, Wei Wei	Drexel Hill	PA	US	
Sariaslani, Fateme Sima	Wilmington	DE	US	
Tang, Xiao-Song	Hockessin	DE	US	

US-CL-CURRENT: 800/295; 435/108, 435/136, 435/191, 435/252.3, 435/254.2

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Sequences](#) | [Attachments](#) | [Claims](#) | [KMC](#) | [Drawn De](#)

4. Document ID: US 20020102712 A1

L3: Entry 4 of 35

File: PGPB

Aug 1, 2002

PGPUB-DOCUMENT-NUMBER: 20020102712

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020102712 A1

TITLE: Phenylalanine ammonia lyase polypeptide and polynucleotide sequences and methods of obtaining and using same

PUBLICATION-DATE: August 1, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Yoshida, Roberta K.	Buffalo Grove	IL	US	
Kootstra, Anna B.	Island Lake	IL	US	

US-CL-CURRENT: 435/232; 435/254.2, 435/320.1, 435/69.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMPC	Drawn D
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5. Document ID: US 20010053847 A1

L3: Entry 5 of 35

File: PGPB

Dec 20, 2001

PGPUB-DOCUMENT-NUMBER: 20010053847

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010053847 A1

TITLE: Bioproduction of para-hydroxycinnamic acid

PUBLICATION-DATE: December 20, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Tang, Xiao-Song	Hockessin	DE	US	

US-CL-CURRENT: 536/23.2; 434/232, 435/146, 435/252.3, 435/6, 435/69.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMPC	Drawn D
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6. Document ID: US 6521748 B2

L3: Entry 6 of 35

File: USPT

Feb 18, 2003

US-PAT-NO: 6521748

DOCUMENT-IDENTIFIER: US 6521748 B2

TITLE: Polynucleotide encoding a mutant Rhodotorula glutinis tyrosine ammonia lyase polypeptide

DATE-ISSUED: February 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tang; Xiao-Song	Hockessin	DE		

US-CL-CURRENT: 536/23.2; 435/232

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMPC	Drawn D
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7. Document ID: US 6368837 B1

L3: Entry 7 of 35

File: USPT

Apr 9, 2002

US-PAT-NO: 6368837

DOCUMENT-IDENTIFIER: US 6368837 B1

TITLE: Bioproduction of para-hydroxycinnamic acid

DATE-ISSUED: April 9, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gatenby; Anthony A.	Wilmington	DE		
Sariaslani; Sima	Newark	DE		
Tang; Xiao-Song	Hockessin	DE		
Qi; Wei Wei	Drexel Hill	PA		
Vannelli; Todd	Ithaca	NY		

US-CL-CURRENT: 435/146; 435/232

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Abstracts](#) | [Assignments](#) | [Claims](#) | [KOMC](#) | [Drawn D](#)

8. Document ID: US 6355468 B1

L3: Entry 8 of 35

File: USPT

Mar 12, 2002

US-PAT-NO: 6355468

DOCUMENT-IDENTIFIER: US 6355468 B1

**** See image for Certificate of Correction ****

TITLE: Phenylalanine ammonia lyase polypeptide and polynucleotide sequences and methods of obtaining and using same

DATE-ISSUED: March 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yoshida; Roberta K.	Buffalo Grove	IL		
Kootstra; Anna B.	Island Lake	IL		

US-CL-CURRENT: 435/232; 435/254.2, 536/23.2

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Abstracts](#) | [Assignments](#) | [Claims](#) | [KOMC](#) | [Drawn D](#)

9. Document ID: US 6211434 B1

L3: Entry 9 of 35

File: USPT

Apr 3, 2001

US-PAT-NO: 6211434

DOCUMENT-IDENTIFIER: US 6211434 B1

**** See image for Certificate of Correction ****

TITLE: Amino polyol amine oxidase polynucleotides and related polypeptides and methods of use

DATE-ISSUED: April 3, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Duvick; Jonathan P.	Des Moines	IA		
Gilliam; Jacob T.	Norwalk	IA		
Maddox; Joyce R.	Des Moines	IA		

US-CL-CURRENT: 800/279; 435/183, 435/195, 435/196, 435/320.1, 435/348, 435/419,
435/468, 435/69.1, 435/70.1, 435/71.1, 536/23.2, 536/23.7, 536/24.1, 800/278,
800/286, 800/288, 800/306, 800/312, 800/314, 800/317.4, 800/320, 800/320.1,
800/320.2, 800/320.3, 800/322

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Specification](#) | [Abstract](#) | [Claims](#) | [KWMC](#) | [Drawn D](#)

10. Document ID: US 5981239 A

L3: Entry 10 of 35

File: USPT

Nov 9, 1999

US-PAT-NO: 5981239

DOCUMENT-IDENTIFIER: US 5981239 A

** See image for Certificate of Correction **

TITLE: Synthesis of optically active phenylalanine analogs using Rhodotorula graminis

DATE-ISSUED: November 9, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liu; Weiguo	Buffalo Grove	IL		

US-CL-CURRENT: 435/108; 435/280

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Specification](#) | [Abstract](#) | [Claims](#) | [KWMC](#) | [Drawn D](#)

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phenylalanine ammonia lyase with rhodotorula	35

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L3: Entry 12 of 35

File: USPT

Jul 12, 1988

US-PAT-NO: 4757015

DOCUMENT-IDENTIFIER: US 4757015 A

TITLE: Phenylalanine ammonia lyase-producing strains

DATE-ISSUED: July 12, 1988

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Orndorff; Steve A.	Rockville	MD		
Durham; Don R.	Gaithersburg	MD		

US-CL-CURRENT: [435/108](#); [435/174](#), [435/232](#), [435/255.1](#), [435/911](#)

CLAIMS:

What is claimed is new and intended to be covered by letters patent of the United States is:

1. A Rhodotorula graminis strain having the identifying characteristics of strain GX 6000, its progeny or phenylalanine ammonia lyase (PAL)-producing mutants thereof.

2. The strain of claim 1 in immobilized form.

3. A fermentation culture comprising any of the strains of claim 1.

4. The fermentation culture of claim 3 which comprises an amino acid inducer selected from the group consisting of phenylalanine, leucine, isoleucine or mixtures thereof.

5. A microbiological catalytic method of producing phenylalanine from trans cinnamate and ammonia which comprises:

(1) contacting a mixture of trans cinnamate and ammonia with any of the strain of claim 1, and

(2) recovering said phenylalanine.

6. A method of inducing PAL formation in a fermentation medium containing any of the strains of claim 1, which comprises adding to said fermentation medium synergistic inducing amounts of phenylalanine plus isoleucine or phenylalanine plus leucine.

7. A method of producing phenylalanine from trans cinnamate and ammonia which comprises

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11. Document ID: US 5948660 A

Using default format because multiple data bases are involved.

L3: Entry 11 of 35

File: USPT

Sep 7, 1999

US-PAT-NO: 5948660

DOCUMENT-IDENTIFIER: US 5948660 A

TITLE: DNA fragment encoding D-amino acid oxidase

DATE-ISSUED: September 7, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Pilone; Mirella	Milan			IT

US-CL-CURRENT: 435/191; 435/252.3, 435/320.1, 435/69.1, 536/23.2, 536/24.3

Full	Title	Citation	Front	Review	Classification	Date	Reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Claims	KUMC	Drawn D
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12. Document ID: US 4757015 A

L3: Entry 12 of 35

File: USPT

Jul 12, 1988

US-PAT-NO: 4757015

DOCUMENT-IDENTIFIER: US 4757015 A

TITLE: Phenylalanine ammonia lyase-producing strains

DATE-ISSUED: July 12, 1988

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Orndorff; Steve A.	Rockville	MD		
Durham; Don R.	Gaithersburg	MD		

US-CL-CURRENT: 435/108; 435/174, 435/232, 435/255.1, 435/911

Full	Title	Citation	Front	Review	Classification	Date	Reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Claims	KUMC	Drawn D
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13. Document ID: US 4731469 A

L3: Entry 13 of 35

File: USPT

Mar 15, 1988

US-PAT-NO: 4731469

DOCUMENT-IDENTIFIER: US 4731469 A

** See image for Certificate of Correction **

TITLE: Process for recovery and purification of L-phenylalanine

DATE-ISSUED: March 15, 1988

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Evans; David L.	Arvada	CO		
Thimmig; Roberta L.	Brighton	CO		
Koltz; Robert C.	Lafayette	CO		

US-CL-CURRENT: 562/443

Full	Title	Citation	Front	Review	Classification	Date	Reference	Descriptive	Assignment	Claims	KWIC	Drawn De
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 14. Document ID: US 4728611 A

L3: Entry 14 of 35

File: USPT

Mar 1, 1988

US-PAT-NO: 4728611

DOCUMENT-IDENTIFIER: US 4728611 A

TITLE: Production of phenylalanine with immobilized cells

DATE-ISSUED: March 1, 1988

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wood; Louis L.	Rockville	MD		
Calton; Gary J.	Elkridge	MD		

US-CL-CURRENT: 435/108; 435/174, 435/177, 435/180, 435/182

Full	Title	Citation	Front	Review	Classification	Date	Reference	Descriptive	Assignment	Claims	KWIC	Drawn De
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 15. Document ID: US 4710467 A

L3: Entry 15 of 35

File: USPT

Dec 1, 1987

US-PAT-NO: 4710467

DOCUMENT-IDENTIFIER: US 4710467 A

TITLE: Process for preparing phenylalanine

DATE-ISSUED: December 1, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wood; Louis L.	Rockville	MD		
Carlton; Gary J.	Elkridge	MD		

US-CL-CURRENT: 435/108; 435/180, 435/182

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Description](#) | [Abstract](#) | [Claims](#) | [KMC](#) | [Drawn De](#)

16. Document ID: US 4600692 A

L3: Entry 16 of 35

File: USPT

Jul 15, 1986

US-PAT-NO: 4600692

DOCUMENT-IDENTIFIER: US 4600692 A

TITLE: Immobilized cells for preparing phenylalanine

DATE-ISSUED: July 15, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wood; Louis L.	Rockville	MD		
Calton; Gary J.	Elkridge	MD		

US-CL-CURRENT: 435/108; 435/180, 435/182

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Description](#) | [Abstract](#) | [Claims](#) | [KMC](#) | [Drawn De](#)

17. Document ID: US 4584273 A

L3: Entry 17 of 35

File: USPT

Apr 22, 1986

US-PAT-NO: 4584273

DOCUMENT-IDENTIFIER: US 4584273 A

TITLE: Method for the production of phenylalanine ammonia-lyase by fermentation

DATE-ISSUED: April 22, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Finkelman; Malcolm A. J.	Gaithersburg	MD		
Yang; Huei-Hsuing	Rockville	MD		

US-CL-CURRENT: 435/232; 435/108, 435/801

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Searches](#) | [Attachments](#) | [Claims](#) | [KOMC](#) | [Drawn De](#)

18. Document ID: US 4584269 A

L3: Entry 18 of 35

File: USPT

Apr 22, 1986

US-PAT-NO: 4584269

DOCUMENT-IDENTIFIER: US 4584269 A

TITLE: Method for stabilizing the enzymatic activity of phenylalanine ammonia lyase during L-phenylalanine production

DATE-ISSUED: April 22, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Vollmer; Patricia J.	Olney	MD		
Schruben; Jeffrey J.	Rockville	MD		
Montgomery; John P.	Clarksburg	MD		
Yang; Huei-Hsuing	Rockville	MD		

US-CL-CURRENT: 435/108; 435/188, 435/232, 435/801, 435/911

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Searches](#) | [Attachments](#) | [Claims](#) | [KOMC](#) | [Drawn De](#)

19. Document ID: US 4574117 A

L3: Entry 19 of 35

File: USPT

Mar 4, 1986

US-PAT-NO: 4574117

DOCUMENT-IDENTIFIER: US 4574117 A

TITLE: Stabilization of phenylalanine ammonia-lyase in a bioreactor using reducing agents

DATE-ISSUED: March 4, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Vollmer; Patricia J.	Paducah	KY		
Schruben; Jeffrey J.	Paducah	KY		

US-CL-CURRENT: 435/108; 435/188, 435/232

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Searches](#) | [Attachments](#) | [Claims](#) | [KOMC](#) | [Drawn De](#)

20. Document ID: US 4562151 A

L3: Entry 20 of 35

File: USPT

Dec 31, 1985

US-PAT-NO: 4562151

DOCUMENT-IDENTIFIER: US 4562151 A

TITLE: Stabilization of L-phenylalanine ammonia-lyase enzyme

DATE-ISSUED: December 31, 1985

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kishore; Ganesh M.	St. Peters	MO		

US-CL-CURRENT: 435/108; 435/116, 435/128, 435/188, 435/232[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Abstract](#) | [Claims](#) | [KIMC](#) | [Drawn D](#)[Clear](#) | [Generate Collection](#) | [Print](#) | [Fwd Refs](#) | [Bkwd Refs](#) | [Generate OACS](#)

Terms

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phenylalanine ammonia lyase with rhodotorula

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WEST Search History

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<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ</i>			
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<input type="checkbox"/>	L3	phenylalanine ammonia lyase with rhodotorula	35
<input type="checkbox"/>	L2	l1 and dna	24
<input type="checkbox"/>	L1	phenylalanine ammonia lyase.clm.	40

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FILE 'AGRICOLA' ENTERED AT 14:09:49 ON 16 SEP 2004

=> s phenylalanine ammonia lyase and rhodotorula
L1 0 PHENYLALININE AMMONIA LYASE AND RHODOTORULA

=> s phenylalanine ammonia lyase and rhodotorula
L2 359 PHENYLALANINE AMMONIA LYASE AND RHODOTORULA

=> dup rem 12
PROCESSING COMPLETED FOR L2
L3 181 DUP REM L2 (178 DUPLICATES REMOVED)

=> s l3 and graminis
L4 7 L3 AND GRAMINIS

=> d l4 1-4 ibib ab

L4 ANSWER 1 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:575659 HCAPLUS
DOCUMENT NUMBER: 137:120742
TITLE: Genomic and cDNA and protein sequences of
phenylalanine ammonia-lyase
from Rhodotorula graminis
INVENTOR(S): Yoshida, Roberta K.; Kootstra, Anna B.
PATENT ASSIGNEE(S): Pcbu Services, Inc., USA
SOURCE: U.S. Pat. Appl. Publ., 74 pp., Cont.-in-part of U. S.
Ser. No. 624,693.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2002102712	A1	20020801	US 2001-939408	20010824
US 6355468	B1	20020312	US 2000-624693	20000724
WO 2002008402	A2	20020131	WO 2001-US23270	20010724
WO 2002008402	A3	20030103		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
WO 2003018759	A2	20030306	WO 2002-US26934	20020823
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
PRIORITY APPLN. INFO.:			US 2000-624693	A2 20000724
			WO 2001-US23270	A2 20010724
			US 2001-939408	A 20010824

AB The present provides a **Rhodotorula graminis** phenylalanine-lyase (EC 4.3.1.5) polypeptide, genomic and cDNA polynucleotides that encode the polypeptide, and methods of obtaining and using these products. In particular the polypeptide can be employed for the prodn. of L-phenylalanine, phenylalanine analogs, and optically active unnatural amino acids having phenylalanine-like structures.

L4 ANSWER 2 OF 7 HCPLUS COPYRIGHT 2004 ACS on STN
 ACCESSION NUMBER: 2002:90209 HCPLUS
 DOCUMENT NUMBER: 136:147127
 TITLE: Isolation of **phenylalanine ammonia lyase** mutant gene from **Rhodotorula** and its use in production of phenylalanine for therapeutic use
 INVENTOR(S): Yoshida, Roberta K.; Kootstra, Anna B.
 PATENT ASSIGNEE(S): PCBU Services, Inc., USA
 SOURCE: PCT Int. Appl., 135 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002008402	A2	20020131	WO 2001-US23270	20010724
WO 2002008402	A3	20030103		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 6355468	B1	20020312	US 2000-624693	20000724

EP 1303623	A2	20030423	EP 2001-955938	20010724
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				
IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2002102712	A1	20020801	US 2001-939408	20010824
PRIORITY APPLN. INFO.:			US 2000-624693	A2 20000724
			WO 2001-US23270	W 20010724

AB The present provides a mutant **phenylalanine ammonia lyase** (PAL) gene isolated from **Rhodotorula graminis** strain ATCC 20804 which produces 4-5 fold higher PAL than normal strain. The mutant gene contains a mutation at the codon (GCC.fwdarw.GTC) for amino acid 153 (Ala.fwdarw.Val). The sequence homol. of PAL gene and protein with those from other species is also presented. The invention also provides the vector and methods for expression and purifn. of PAL in yeast. In particular the polypeptide can be employed for the prodn. of phenylalanine, phenylalanine analogs, and optically active unnatural amino acids having phenylalanine-like structures for therapeutic use.

L4 ANSWER 3 OF 7 HCPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:207983 HCPLUS
 DOCUMENT NUMBER: 134:236337
 TITLE: Synthesis of optically active phenylalanine analogs through microbial transformations
 INVENTOR(S): Liu, Weiguo
 PATENT ASSIGNEE(S): NSC Technologies Company, L.L.C., USA
 SOURCE: Eur. Pat. Appl., 20 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1085095	A1	20010321	EP 1999-250321	19990913
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				
IE, SI, LT, LV, FI, RO				

PRIORITY APPLN. INFO.: EP 1999-250321 19990913

OTHER SOURCE(S): CASREACT 134:236337; MARPAT 134:236337

AB A biocatalytic process to produce optically active phenylalanine analogs from arylacrylic acids is disclosed in which **Rhodotorula graminis** yeast contg. **phenylalanine ammonia-lyase** or the free enzyme introduces a mol. of ammonia stereoselectively onto the double bond of a 3-substituted acrylic acid of formula I to produce a 3-substituted amino acid of the formula II. The substituent (R) at the 3-position of the 3-substituted acrylic acid includes, for example, arom. rings such as substituted or unsubstituted Ph groups, five member arom. heterocyclics, and six member arom. heterocyclics. Thus, when 10 g of 3-fluorocinnamic acid was mixed with 200 mL of 10% aq. ammonium hydroxide and 40 g thawed cells of **Rhodotorula graminis** ATCC 20804 and reacted for 24 h at 30 .degree.C, 3.6 g of L-3-fluorophenylalanine was produced.

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 7 HCPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:718888 HCPLUS
 DOCUMENT NUMBER: 131:321632
 TITLE: Synthesis of optically active phenylalanine analogs using **Rhodotorula graminis**
 INVENTOR(S): Liu, Weiguo
 PATENT ASSIGNEE(S): Great Lakes Chemical Corp., USA
 SOURCE: U.S., 9 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5981239	A	19991109	US 1997-936607	19970924
JP 2001112495	A2	20010424	JP 1999-294030	19991015

PRIORITY APPLN. INFO.:

CASREACT 131:321632; MARPAT 131:321632

AB A biocatalytic process to produce optically active phenylalanine analogs from arylacrylic acids is disclosed in which *R. graminis* yeast contg. **phenylalanine ammonia-lyase** introduces a mol. of NH₃ stereoselectively onto the double bond of a 3-substituted acrylic acid. The substituent at the 3-position of the 3-substituted acrylic acid includes, for example, arom. rings such as substituted Ph groups, 5-member arom. heterocyclics, and 6-member arom. heterocyclics.

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d his

(FILE 'HOME' ENTERED AT 14:08:56 ON 16 SEP 2004)

FILE 'MEDLINE, HCAPLUS, BIOSIS, BIOTECHDS, SCISEARCH, EMBASE, AGRICOLA'
ENTERED AT 14:09:49 ON 16 SEP 2004

L1 0 S PHENYLALANINE AMMONIA LYASE AND RHODOTORULA
L2 359 S PHENYLALANINE AMMONIA LYASE AND RHODOTORULA
L3 181 DUP REM L2 (178 DUPLICATES REMOVED)
L4 7 S L3 AND GRAMINIS

=> s l3 and 1990-2000

L5 0 L3 AND 1990-2000

=> s l3 and 1990-2000/py

6 FILES SEARCHED...

L6 49 L3 AND 1990-2000/PY

=> focus 16

PROCESSING COMPLETED FOR L6

L7 49 FOCUS L6 1-

=> d 17 1-10 ibib ab

L7 ANSWER 1 OF 49 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:117507 HCAPLUS

DOCUMENT NUMBER: 114:117507

TITLE: The effects of sunflower L-**phenylalanine ammonia-lyase** inactivating factor on Rhodotorula glutinis L-**phenylalanine ammonia-lyase**

AUTHOR(S): Gupta, Subhash C.; Creasy, Leroy L.

CORPORATE SOURCE: NRRC, ARS, Peoria, IL, 61604, USA

SOURCE: Phytochemistry (1991), 30(1), 85-8

DOCUMENT TYPE: CODEN: PYTCAS; ISSN: 0031-9422

LANGUAGE: English

AB **Phenylalanine ammonia-lyase** inactivating factor (IF) prep'd. from chloroplasts isolated from sunflower leaves was utilized to study its inactivating effects on L-**phenylalanine ammonia-lyase** from *R. glutinis* in vitro. The effects of inactivation by inactivating factor were compared with those caused by chems. such as Na borohydride and nitromethane. The sunflower inactivator

acted as an enzyme and enzymic inactivation caused irreversible loss of **phenylalanine ammonia-lyase** catalytic activity accompanied by shortening of the enzyme mol. However, the capacity of IF-inactivated **phenylalanine ammonia-lyase** to bind to L-phenylalanine, the enzyme substrate, was maintained. These effects of the inactivating factor from sunflower leaves are quite different from those of inhibitors (reversible loss of catalytic activity) isolated from different sources by other workers. The results suggest that inactivation plays an important role in in vivo regulation of phenylpropanoid metab.

L7 ANSWER 2 OF 49 HCPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:291436 HCPLUS

DOCUMENT NUMBER: 129:65318

TITLE: Production and characterization of
phenylalanine ammonia-lyase

from **Rhodotorula aurantiaca** K-505

AUTHOR(S): Cho, Dae-Haeng; Chae, Hee-Jeong; Kim, Eui Yong

CORPORATE SOURCE: Dept. of Chemical Engineering, The University of Seoul, Seoul, 130-743, S. Korea

SOURCE: Journal of Food Science and Nutrition (1997), 2(4), 354-359

CODEN: JFSNFW; ISSN: 1226-332X

PUBLISHER: Korean Society of Food Science and Nutrition

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Optimal cultivation conditions for the prodn. of **phenylalanine ammonia-lyase**(PAL) from **Rhodotorula aurantiaca**

K-505 were selected, and the kinetic parameters of the produced PAL were detd. The most suitable carbon and nitrogen sources were glucose and tryptone, resp. The strain expressed PAL constitutively when using the optimized semi-complex media. High cell d. culture could be crit. for maximal prodn. of PAL since the PAL biosynthesis was growth assocd. Maximum PAL activity was obsd. at initial pH 6.0. Although the cell growth was not markedly affected by temp. between 22 and 28.degree.C, the cells yielded the max. PAL activity when cultivated at 22.degree.C. The max. activity for the deamination of L-phenylalanine to trans-cinnamic acid was obsd. around pH 8.8. The PAL activity gave the max. at 45.degree.C, and greatly decreased at higher than 50.degree.C. Activation energy(Ea) calcd. from Arrhenius equation was 6.28 kcal/mol in the range of 22.degree.C to 40.degree.C. A Hanes-Woolf plot showed that the enzyme reaction follows Michaelis-Menten equation, whose KM and Vmax values were 4.65 .times. 10-3M and 0.89 .mu.mol/mg-min resp.

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 3 OF 49 HCPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:255323 HCPLUS

DOCUMENT NUMBER: 124:283939

TITLE: Purification of **phenylalanine ammonia lyase** from

Rhodotorula glutinis

AUTHOR(S): D'Cunha, Godwin B.; Satyanarayan, Vaduvatha; Nair, P. Madhusudanan

CORPORATE SOURCE: Food Technology Div., BARC, Bombay, 400 085, India

SOURCE: Phytochemistry (1996), 42(1), 17-20

CODEN: PYTCAS; ISSN: 0031-9422

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A simple and rapid method employing four steps; sonication, salt pptn., gel filtration on Sephadryl-S-400 followed by hydrophobic interaction chromatog. on Ph Sepharose CL-4B for the purifn. of **phenylalanine ammonia lyase** from the yeast **Rhodotorula** glutinis is described. The prepn. gave an overall yield of 33%, 195-fold

purifn. and a high specific activity of 4.69 U mg⁻¹ protein. The final prepn. was homogeneous as judged from native polyacrylamide gel electrophoresis.

L7 ANSWER 4 OF 49 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:836595 HCAPLUS
DOCUMENT NUMBER: 123:254637
TITLE: Stabilization of **phenylalanine ammonia-lyase** in **Rhodotorula rubra** by host compound .beta.-cyclodextrin
AUTHOR(S): Zhao, Jianshen; Yang, Shunkai
CORPORATE SOURCE: Chengdu Inst. Biol., Acad. Sin., Chengdu, 610041, Peop. Rep. China
SOURCE: Tianran Chanwu Yanjiu Yu Kaifa (1995), 7(2), 27-33
CODEN: TCYKE5; ISSN: 1001-6880
PUBLISHER: Tianran Chanwu Yanjiu Yu Kaifa Bianjibu
DOCUMENT TYPE: Journal
LANGUAGE: Chinese
AB The effect of the host compd. .beta.-cyclodextrin (.beta.-CD) on the reaction of **L-phenylalanine ammonia-lyase** (PAL, EC 4.3.1.5) in the whole cells of **Rhodotorula rubra** AS2.166, in the aq. media of trans-cinnamic acid (CA) and ammonia were investigated. The results showed that the PAL was stabilized significantly to allow the PAL-catalyzed conversion of CA into L-phenylalanine (L-phe) to proceed smoothly in the presence of high concn. of CA when a proper amt. of host compd. .beta.-CD was added into the above CA media. The optimum amt. of .beta.-CD required to overcome the substrate inhibition of PAL activity increased as the CA concn. level raised, and it was about twelfth to fourth of that of CA (mole). The most effective addn. of .beta.-CD in the conversion media ranged from 6 to 50 mmol/L when the employed CA concn. ranged from 100 to 250 mmol/L. Both the initial rates of conversion and the final L-phe prodn. in this new biocatalytical media, i.e., PAL-.beta.-CD, contg. high concn. of CA were much more satisfactory than in the media without .beta.-CD.

L7 ANSWER 5 OF 49 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:560957 HCAPLUS
DOCUMENT NUMBER: 123:4319
TITLE: Bioconversion of trans-cinnamic acid to L-phenylalanine by **L-phenylalanine ammonia-lyase** of **Rhodotorula glutinis**: parameters and kinetics
AUTHOR(S): Takac, Serpil; Akay, Buelent; Oezdamar, Tuncer H.
CORPORATE SOURCE: Dep. Chem. Eng., Ankara Univ., Ankara, Turk.
SOURCE: Enzyme and Microbial Technology (1995), 17(5), 445-52
CODEN: EMTED2; ISSN: 0141-0229

PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 123:4319
AB The kinetics of bioconversion of trans-cinnamic acid to **L-phenylalanine ammonia-lyase** (PAL) enzyme of resting cells of **Rhodotorula glutinis** have been studied under the optimum bioreaction conditions detd. The optimum pH, temp., ammonia concns. and biocatalyst loading were 10.5, 30.degree., 8 M, and .apprx.2 (wt./wt.), resp. Among various chems., sodium glutamate and penicillin were found to increase the PAL activity of the cells. A max. concn. of 76.18 mM (12.57 g dm⁻³) L-phenylalanine was maintained from 100 mM (14.8 g dm⁻³) trans-cinnamic acid after 104 h of the residence time in the fed-batch operation of the bioreactor. Trans-cinnamic acid concns. higher than 30-50 mM were shown to cause the substrate inhibition, besides the mixed-type inhibition effect of the chloride ions. Mechanistic bioreaction rate equations that incorporate sep. the inhibition effects of

the trans-cinnamic acid and chloride ions, and the activation effect of sodium glutamate, were proposed and the kinetic parameters of the models were calcd.

L7 ANSWER 6 OF 49 HCPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1996:608456 HCPLUS
DOCUMENT NUMBER: 125:245786
TITLE: Stabilization of phenylalanine ammonia lyase-containing Rhodotorula glutinis cells for the continuous synthesis of L-phenylalanine methyl ester
AUTHOR(S): D'Cunha, Godwin B.; Satyanarayan, Vaduvatha; Nair, P. Madhusudanan
CORPORATE SOURCE: Food Technology Div., Bhabha Atomic Res. Center, Bombay, 400 085, India
SOURCE: Enzyme and Microbial Technology (1996), 19(6), 421-427
CODEN: EMTED2; ISSN: 0141-0229
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 125:245786
AB A procedure for the direct one-step synthesis of L-phenylalanine Me ester, a precursor of the artificial sweetener, aspartame, by using phenylalanine ammonia lyase (PAL)-contg.
Rhodotorula glutinis cells in a 2:1 heptane:0.1 M Tris-sulfate buffer pH 9.0 biphasic system was reported earlier; however, the yeast cells lost PAL activity rapidly during the reaction and were rendered unsuitable for repeated use. Stabilization of the enzyme during the biotransformation for the continuous use is described. Immobilization of PAL-contg. Rhodotorula glutinis cells by different conventional methods could not prevent the inactivation of the enzyme. The addn. of a low concn. of Mg²⁺ to the incubation mixts. resulted in significant stabilization of PAL which was further enhanced by the presence of glycerol. At 4 mM MgSO₄ and 10% glycerol concns., the system could produce L-phenylalanine Me ester for nine cycles of repeated use while the controls lost activity by the fourth cycle. The total yield of L-phenylalanine Me ester in nine cycles was 92 g L-1.

L7 ANSWER 7 OF 49 HCPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1994:483911 HCPLUS
DOCUMENT NUMBER: 121:83911
TITLE: Novel direct synthesis of L-phenylalanine methyl ester by using Rhodotorula glutinis phenylalanine ammonia lyase in an organic-aqueous biphasic system
AUTHOR(S): D'Cunha, Godwin B.; Satyanarayan, Vaduvatha; Nair, P. Madhusudanan
CORPORATE SOURCE: Food Technol. Enzyme Eng. Div., Bhabha At. Res. Cen., Bombay, India
SOURCE: Enzyme and Microbial Technology (1994), 16(4), 318-22
CODEN: EMTED2; ISSN: 0141-0229
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 121:83911
AB A procedure for the direct, one-step enzymic conversion of trans-cinnamyl Me ester to L-phenylalanine Me ester is described. The reverse reaction of phenylalanine ammonia lyase from Rhodotorula glutinis was utilized for this conversion. Insol. of substrate trans-cinnamyl Me ester in aq. buffer soln. was overcome by employing an org.-aq. biphasic system, heptane:0.1 M Tris-sulfate buffer, pH 9.0 (2:1). Different conditions were optimized for the maximal conversion such as time (16-18 h), temp. (30.degree.), pH (9.0), concn. of substrates, 0.1 M trans-cinnamyl Me ester and 1 M (NH₄)₂SO₄, and nature of

the org. solvent (heptane); about 70% conversion of substrate to product was obtained under these conditions. Formation of the product, L-phenylalanine Me ester, was identified by paper chromatog. and was further confirmed by autoradiog. and NMR spectral analyses.

L7 ANSWER 8 OF 49 HCPLUS COPYRIGHT 2004 ACS on STN
 ACCESSION NUMBER: 1994:699296 HCPLUS
 DOCUMENT NUMBER: 121:299296
 TITLE: **Phenylalanine ammonia-**
lyase activity enhancement in permeabilized
yeast cells (*Rhodotorula glutinis*)
 AUTHOR(S): Srinivasan, A. R.; Nagajyothi; Gowda, L. R.; Bhat, S. G.
 CORPORATE SOURCE: Dep. Biochem. Nutrition, Central Food Technol. Res. Inst., Mysore, 570 013, India
 SOURCE: Biotechnology Techniques (1994), 8(10), 729-32
 CODEN: BTECE6; ISSN: 0951-208X
 PUBLISHER: Chapman and Hall
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB Whole cells of the yeast *Rhodotorula glutinis* IFO 0559 had low **phenylalanine ammonia-lyase** (PAL) activity due to a limited membrane permeability barrier for phenylalanine. Permeabilization with detergents and org. solvents increased cellular PAL activity significantly and of these cetyltrimethylammonium bromide gives the max. increase (6-fold). PAL activity of such detergent permeabilized cells could be used for the synthesis and degrdn. of L-phenylalanine.

L7 ANSWER 9 OF 49 HCPLUS COPYRIGHT 2004 ACS on STN
 ACCESSION NUMBER: 1995:452135 HCPLUS
 DOCUMENT NUMBER: 122:208686
 TITLE: Stabilization of **phenylalanine ammonia lyase** by crosslinking or mutation and use of stabilized enzyme as pharmaceutical
 INVENTOR(S): Eigtved, Peter; Clausen, Ib Groth
 PATENT ASSIGNEE(S): Novo Nordisk A/S, Den.
 SOURCE: PCT Int. Appl., 25 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9500171	A1	19950105	WO 1994-DK224	19940609 <--
W: AU, BB, BG, BR, BY, CA, CN, CZ, FI, HU, JP, KP, KR, KZ, LK, LV, MG, MN, MW, NO, NZ, PL, RO, RU, SD, SK, UA, US, UZ, VN				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
CA 2165281	AA	19950105	CA 1994-2165281	19940609 <--
AU 9470675	A1	19950117	AU 1994-70675	19940609 <--
EP 703788	A1	19960403	EP 1994-919559	19940609 <--
EP 703788	B1	20011121		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, NL, PT, SE				
AT 209044	E	20011215	AT 1994-919559	19940609
PT 703788	T	20020531	PT 1994-919559	19940609
ES 2168297	T3	20020616	ES 1994-919559	19940609
US 5753487	A	19980519	US 1995-556963	19951212 <--
PRIORITY APPLN. INFO.:			DK 1993-755	A 19930625
			WO 1994-DK224	W 19940609

AB This invention relates to stabilization of **phenylalanine ammonia lyase** (PAL) against proteolytic degrdn. by chem.

modification, e.g. with crosslinking agents, or by genetic modification; a **phenylalanine ammonia lyase** variant; a method of prep. the variant; and, a pharmaceutical compn. contg. **phenylalanine ammonia lyase**. The resistance to chymotrypsin digestion of PAL activity in glutaraldehyde-treated PAL-contg. **Rhodotorula** was demonstrated.

L7 ANSWER 10 OF 49 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1985:421245 HCAPLUS

DOCUMENT NUMBER: 103:21245

TITLE: Stabilization of D-phenylalanine ammonia-lyase enzyme

INVENTOR(S): Kishore, Ganesh Murphy

PATENT ASSIGNEE(S): Monsanto Co., USA

SOURCE: Eur. Pat. Appl., 19 pp.
CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 136996	A2	19850410	EP 1984-870129	19840904 <--
EP 136996	A3	19870401		
EP 136996	B1	19900411		
R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL				
US 4562151	A	19851231	US 1983-529434	19830906
AT 51895	E	19900415	AT 1984-870129	19840904 <--
JP 60156397	A2	19850816	JP 1984-186248	19840905
CA 1215012	A1	19861209	CA 1984-462504	19840905
PRIORITY APPLN. INFO.:			US 1983-529434	19830906
			EP 1984-870129	19840904

OTHER SOURCE(S): CASREACT 103:21245

AB L-Phenylalanine ammonia-lyase (I)

[9024-28-6] is stabilized to trans-cinnamate by polyhydric alcs. or polyethylene glycol. Thus, a reaction mixt. contg. 0.19M polyethylene glycol 400 [25322-68-3], 6.0M NH₃, 240 mM cinnamate, and **Rhodotorula glutinis** cells contg. I was incubated at 37° and pH 11.5. The relative activity of I was 154, compared to an activity of 28 when no polyol was added.

=> d his

(FILE 'HOME' ENTERED AT 14:08:56 ON 16 SEP 2004)

FILE 'MEDLINE, HCAPLUS, BIOSIS, BIOTECHDS, SCISEARCH, EMBASE, AGRICOLA'
ENTERED AT 14:09:49 ON 16 SEP 2004

L1	0 S PHENYLALININE AMMONIA LYASE AND RHODOTORULA
L2	359 S PHENYLALANINE AMMONIA LYASE AND RHODOTORULA
L3	181 DUP REM L2 (178 DUPLICATES REMOVED)
L4	7 S L3 AND GRAMINIS
L5	0 S L3 AND 1990-2000
L6	49 S L3 AND 1990-2000/PY
L7	49 FOCUS L6 1-

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COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	54.23	54.65

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-9.80	-9.80

STN INTERNATIONAL LOGOFF AT 14:16:18 ON 16 SEP 2004